Abramchuk Olga, Arshulik Tetyana. Functional State of Neuromotor System of Lower Limbs for Male-youths. For the study of the functional state of neuromotor vehicle of lower limbs it was conducted electromyographic researches of 30 persons with the different level of motive activity. The group of sportsmen consisted with the students of institute of physical culture and health and and male-youths that constantly visited certain sport sections. The research was conducted by means of multifunction computer complex «Neuro-МВП» applying stimulant EMG methodology. The results of our experiments show that the size of force of stimulus under which maximal M-answer and H-reflex were registered was remarkably lower for young sportsmen. It is fixed, that in the group of sportsmen indices of amplitude of M-answer and H-reflex were considerably higher as compared to control . The analysis of maximal latency of M-answer and H-reflex in the group of sportsmen and control group showed clear cut distinctions regarding the H-reflex indices. The indices of M-answer maximal latency by sportsmen were noticeably lowew as compared to control. It is shown that in the group of sportsmen the correlation of maximal amplitudes M- and H-answers was higher comparatively with control, however reliable distinctions were not revealed.

Key words: electromyography, M-answer, H-reflex, motive activity.

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Studying the cerebral cortex electrical activity of individuals with different psychosocial type in a model of social behavior

During the experiment the main frequency EEG ranges were determine. Their activity is specific to a particular psychosocial type. Psychosocial type of probationers was determined by a complex psychological technique. According to the results all individuals were divided into two psychological groups: with selfish-authoritarian type of social behavior and with friendly-altruistic type. Based on the specific requirements for ERD- / ERS-researches we have created our own methodology – a game «mini-basketball». This model of social behavior has been adapted for selfish and altruistic types of individual social activity. Besides, for the results comparison with available in the literature data, another test situation – play «Stag hunt» was used. Experimental results suggest that the established model of social behavior clearly reflects the ways of it expression in the examined individuals. Analysis of the action choice results in the presented games coincides with different individual's social orientation according to the survey.

Key words: altruïzm, egoïzm, sinhronizatsiya, desinhronizatsiya.

Formulation of the scientific problem and its significance. Studying of the cerebral cortex electrical activity of persons with different types of social activity needs to create distinct deterministic methodological approaches [1, p. 35]. Nowadays the literature presents data about electroencephalographic correlates of the characteristics of social psychotype, but there is no clear methodological basis for studying of this problem [3, p. 742].

Analysis of research problem. The analysis of publications about the problem of human social behavior shows that the study of behavioral strategies for modern psychology is not something new and unique [4]. Thus, a comprehensive study of behavioral strategies was conducted as part of the social psychology in foreign psychology to the middle 80th of the previous century, where the strategies were discussed in the context of interpersonal interaction in conflict situations [2]. Studies, which appeared later, reflected strategies interpretation as behaviors that are used by individuals to deal with the relationship between man and environment [3]. The number of works are devoted to the studying of coping-strategies have increased nowadays; it means the strategy, that is constantly changing cognitive and behavioral attempts to cope with specific external and / or internal demands that are priced by individual as excessive or those that exceed its own resources [5; 6].

The main purpose of the research. The main task of the research is to determinate and adapt the methods that could modulate different situational social human behavior and identify the special aspects of the psychophysiological correlates of the individuals with different social behavioral type by means of the created methods.

The object and methods of the research. 40 males and females, aged 17–24, participated in the experiment. All probationers were right-handed, healthy according to the data of somatic examination. 15 of 20 females took part in the experiment in the postovulatory phase of the menstrual cycle, another 5 – in the follicular phase. The cycle phase was determinate by the questioning of the investigated females.

The psychological testing was conducted to evaluate the psychological characteristics of subjects that were related to their psychosocial type, and general physiological characteristics that might affect the results of our investigation. Following psychological methods were used for the examination:

– Egocentric association test (EAT) created by T. Shustrov, adapted by T. Pashukova.

– Questionnaire of temperament structure by Rusalov. Among 9 scales we took to attention following scales: social toleration (the necessity level of social contacts); social plasticity (the level of easiness and the complexity of change-over from one person to another during the communication); social emotionality (emotional sensibility in the communicational sphere).

– Method of interpersonal relationships diagnosing by T. Leary. Due to this method we can determine the predominant type of attitude to other people in the self-concept and peer assessment. This method was the basic for the probationers' assignment according to the different social groups. After the consideration of 8 different types and after analyzing of all psychological characteristics two different types of social behavior were discriminate according to the discriminative analysis: selfish-authoritarian type and friendly-altruistic type. These experimental groups were the basic for the social behavior type definition.

Bioelectric activity of the cerebral cortex was registered by means of the hardware-software complex «NeuroCom» developed by the «HAI-Medica» scientific and technical center of electronic medical devices and technologies at National Aerospace University.

According to the study purposes the aim was to create original stimulus material. In this connection a special model of social behavior called «mini basketball» game was invented. The game was presented as a set of images joint in 20 series (4–5 images in each). Each image describes the concrete situation on the playground (fig. 1). The playground consists of 6 play fields – 3 fields of one team 3 – of another team. Each player could move only on the fields of his own team. However the sequence of the positions was put beforehand by the experimentator and was the same for all probationers. The course of game was described by consistent changing of the plots (attack of the player's team – attack of the opponent's team – attack of the player's team and etc.). In accordance, in 10 series the ball was controlled by player's team, in 10 series it was controlled by opponent's team.

The probationer received the instruction with the rules before the experiment for the more complex participation in the game process. A probationer was allowed to choose only four variants of action: a) while having a ball – «pass» or «throw», b) with no ball – «move right» or «move left». It was supposed, that the successful actions depended on the number of the opponents, who were situated opposite to the player's field. Thus, if there was only one opponent player opposite the field, the ball considered to hit the target (put into the basket). If there were two or more players, so the opponent's team considered to block the throw. In the case when the opponent team had the ball/ the probationer had to block the throw using actions «Move right» and «Move left» and stand on the field, which was opposite of the opponent player. For example, if the opponent's team had the ball in the second playground, and the probationer's player was situated in the first playground, so the choice of the «Move right» action would be logic.

EEG recording was being carried out during the game (15–20 min. related to the speed of decision-making).

Another stimulus material was represented in a form of the game «Stag Hunt». This game is the standard game in the theory of games and its appliance is well studied in the psychological and psychophysiological researches [1, p. 365]. The game aims the selection one of the presented stimuli («Rabbit» or «Stag») in order to get the biggest benefits taking the partner's (computer's) choice into consideration. The pictures with the rabbit- and stag-image were demonstrated on the screen. Then the probationer had to choose one of the stimuli using the special clicker. Every probationer was instructed that if he chooses «rabbit», independent from the partner's choice, so he will receive 1 point, if both choose «stag», he will receive 3 points, if the probationer chooses «stag» and the partner chooses «rabbit» so the points will not be counted.

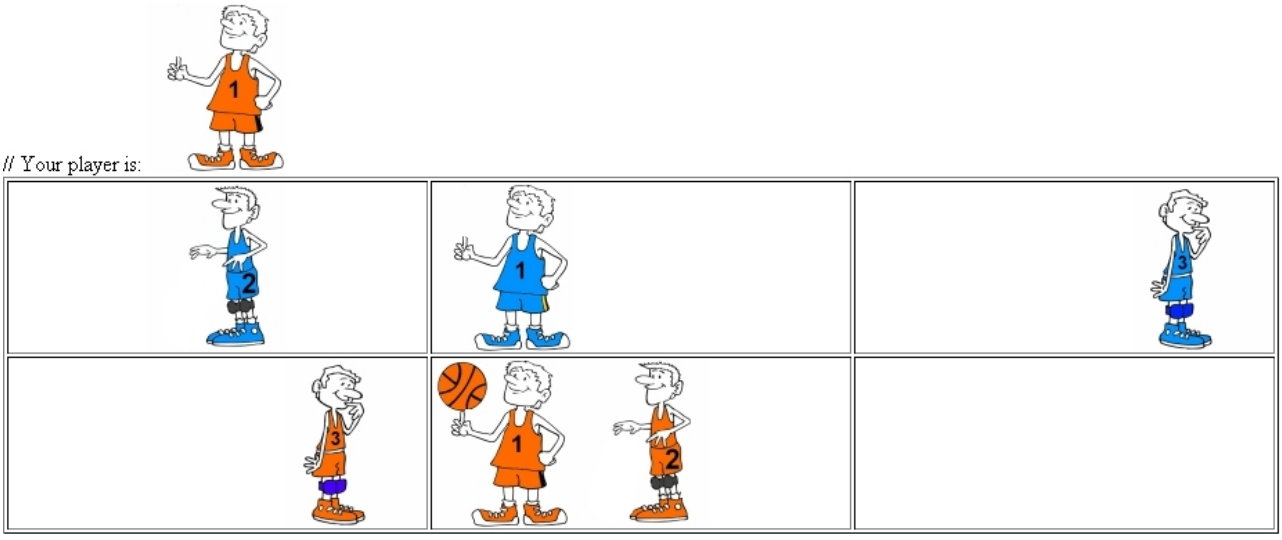

Fig. 1. **The playground and one of the playing positions in the stimulus material «Mini basketball»**

The main task was summed for the following reason: you can hunt on the rabbit by yourself, in spite of the fact, that it's less profitable, and the «stag-hunting» gives you more points, but it demands the high level of trust and orientation on the partners' or command's action. The sequence of choices for the other part was determined by the experimenter. This sequence was pseudorandom (the same for all subjects). Thus, with the help of this game the experimenter was able to follow up the probationer's behavior, at the same time checking the frequency of choices made during 4–5 min of EEG recording.

The accordance of the psychological testing results was compared with the typical features of the stimuli choice in different experimental situations.

Thus, the number of chosen options («Rabbit», «Stag», «Pass», «Throw») was calculated for each group research, in comparison with psychological results (fig. 2).

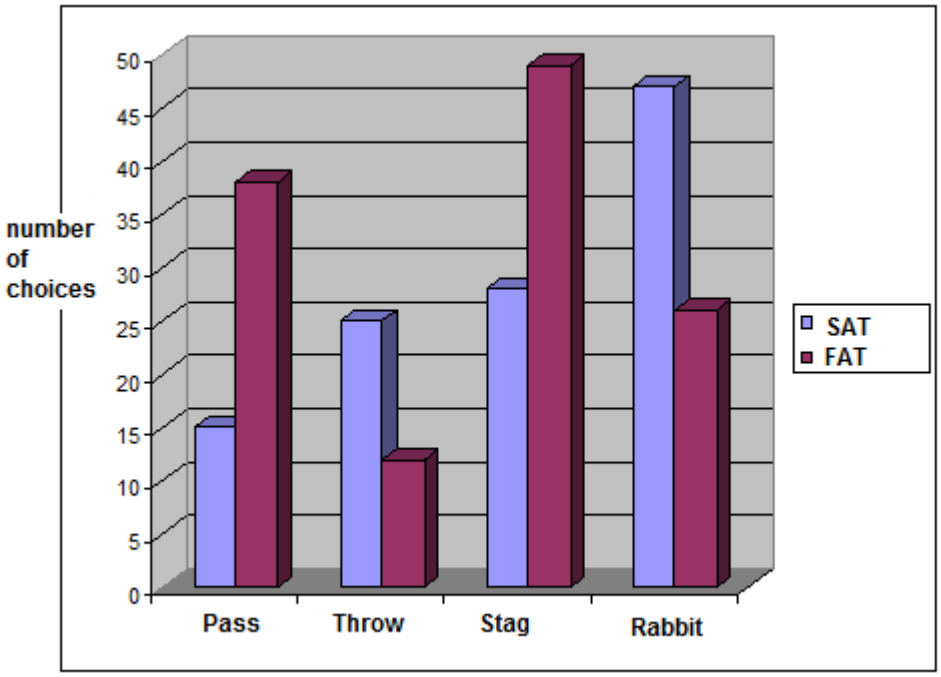

Fig. 2. **Number of choices «Pass», «Throw», «Rabbit», «Stag» in different groups**

We have found out that selfish-authoritarian social behavior individuals in the game «Mini Basketball» tend to choose the command «Throw» more often than those with FAT, who, in their turn, prefer the «Pass» command, thus confirming their disposition to team interactions. While analyzing the «Stag Hunt» game, we have also noticed the similar tendency. Individuals with FAT prefer to hunt «Stag», with their team's support. The SAT individuals, on the contrary, more often choose «Rabbit» stimulus disregarding the fact that their preferences do not win enough points. These differences are statistically-valid according to the Kruskal-Wallis and t-test.

Results and perspectives of further research. The results of the experiment show, that our model of social behaviour reflects the ways of its manifestation in the investigated individuals. The analysis of the action choices results is similar with different social orientation of probationers according to the psychological testing.

Thus, probationers with selfish-authoritarian social behavior type choose the command «Throw» in the game «Mini-basketball» more often, than command «Pass» (the difference is statistically significant). This experimental group representatives also choose more often the stimulus «Rabbit», than «Stag» in the game «Stag hunt». The opposite results were observed in the group of individuals with friendly-altruistic type.

That way, the behavioral reaction characterizes social psychotype of the individual. These results support our previous studies, where we show the differences between the electroencephalographic indexes that are noticed during the ERD/ERS analysis. Looking forward, we're going to make a point to differences in a brain cortex activity using more participants and observe interactions between the electroencephalographic correlates and psychophysiologic and social characteristics of the individual.

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Коцан Ігор, Федорчук Оксана, Кузнецов Ілля. Вивчення особливостей електричної активності кори мозку досліджуваних осіб із різним психосоциотипом у моделі соціальної поведінки. В експерименті були визначені основні частотні діапазони ЕЕГ, активність яких є специфічною для певного психологічного соціотипу (егоїстично-авторитарного та дружньо-альтруїстичного). Розроблено власну модель демонстрації стимульного матеріалу. Вона була адаптована для різних видів соціальної активності особистості. Модель соціальної поведінки чітко відображає її прояв у досліджуваних осіб.

Ключові слова: альтруїзм, егоїзм, синхронізація, десинхронізація.

Коцан Игорь, Федорчук Оксана, Кузнецов Илья. Изучение особенностей электрической активности коры мозга испытуемых лиц с разным психосоциотипом в модели социального поведения. В эксперименте были определены основные частотные диапазоны электроэнцефалограммы (ЭЭГ), активность которых специфическая для определенного психосоциального типа. Психосоциальный тип испытуемых определялся путем комплексной психологической методики. Согласно полученным результатам все исследуемые были разделены на две психологические группы: с эгоистически-авторитарным типом социального поведения и с дружески-альтруистическим типом. Исходя из специфических требований для проведения ERD- / ERS-исследований нами была разработана собственная методика в виде игры «Мини-баскетбол». Данная модель социального поведения была адаптирована для эгоистического и альтруистического типа личностной социальной активности. Кроме того, для сопоставления полученных результатов с имеющимися данными в литературе была использована дополнительная тестовая ситуация – игра «охота на оленя». Результаты эксперимента